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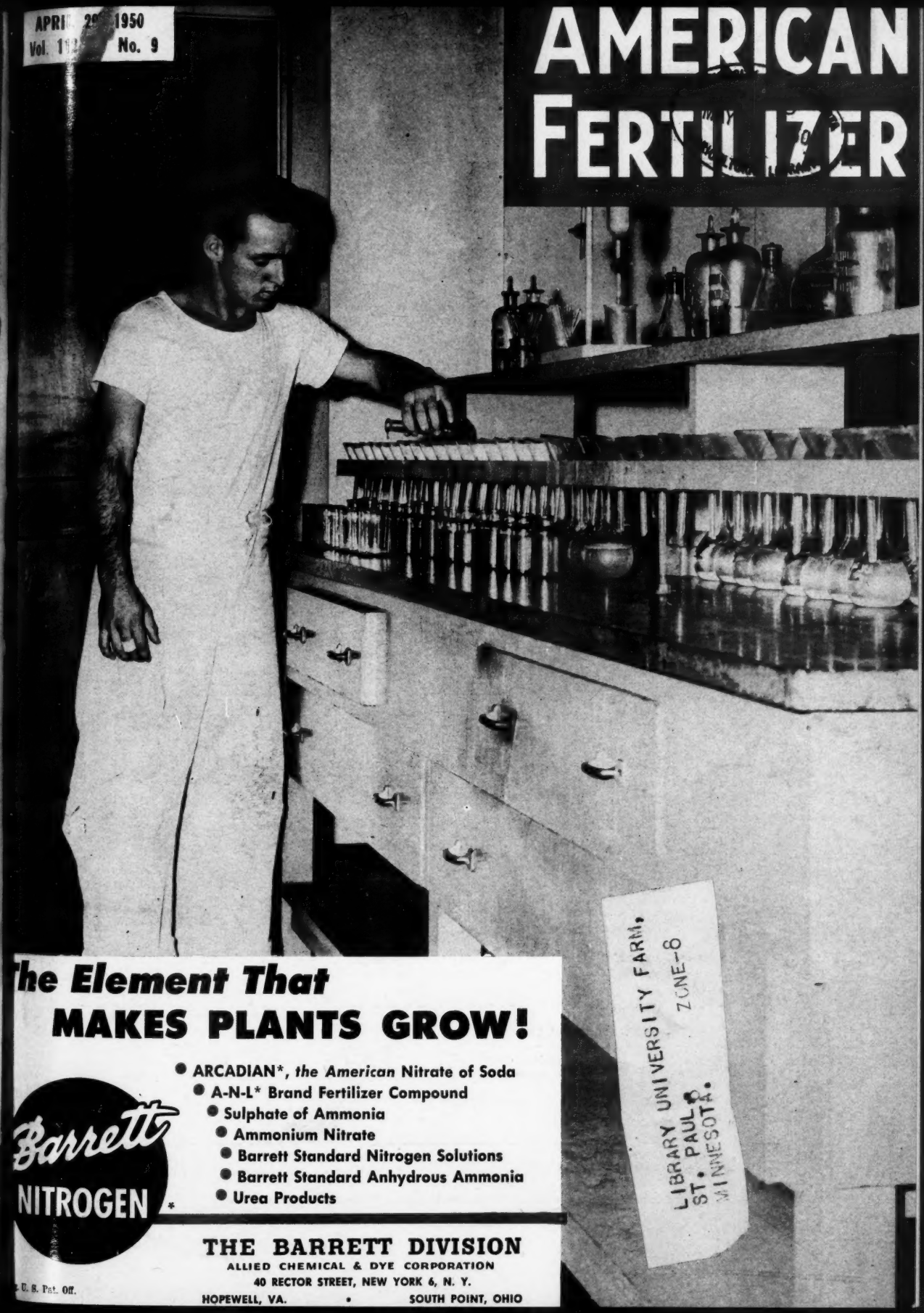
AMERICAN FERTILIZER



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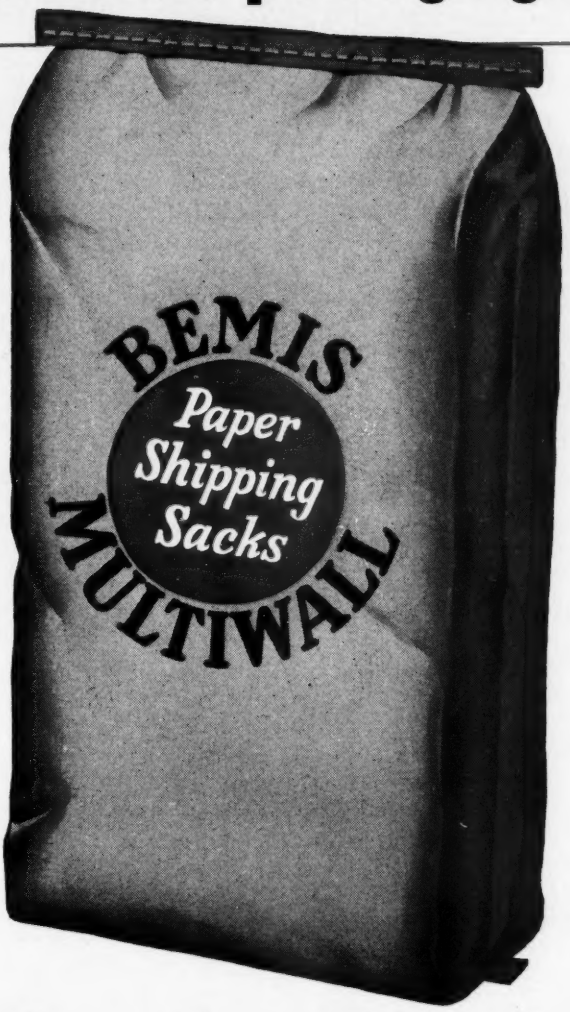

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Henderson, N. C.
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Pensacola, Fla.
Pierce, Fla.
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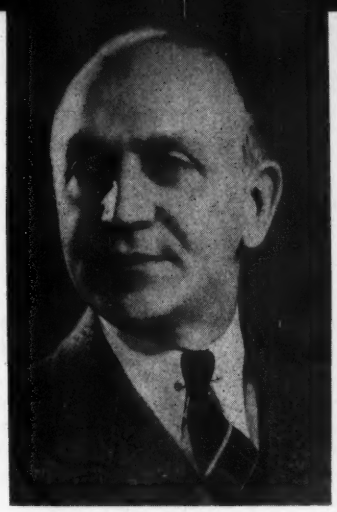
Savannah, Ga.
Spartanburg, S. C.

An Expert Writes of

MINOR ELEMENTS

and Their Importance



Vincent Sauchelli

THIS year we are celebrating the 100th anniversary of the American commercial fertilizer industry. Actually, of course, the birth of the industry occurred when Liebig in Germany and Boussingault in France, reporting the results of their investigations, pointed out the interrelationships of soil minerals to plant growth. Said Liebig: "The primary source whence man and animals derive the means of their growth and support is the vegetable kingdom. Plants, on the other hand, find new nutritive material only in inorganic sources." That was indeed an historic statement. Those men were among the first to interpret in a scientific manner how soil minerals, animal manures, air, light, and moisture influence plant growth. Those early studies led to the industrial production of available phosphates and the utilization of potash salts.

World-Wide

The world-wide development of a chemical fertilizer industry followed in due course of time. For years those engaged in soil fertility investigations and in supplying plant foods concentrated on those nutrients which seemed to be required in largest quantities—nitrogen, phosphorus, potassium, and calcium. It is only in comparatively recent years that a more comprehensive understanding has been developed of the plant's requirements of other nutrients. Our knowledge is, unfortunately, still limited, but at least it can be said that the fertilizer industry is fully aware of the importance of so-called secondary and minor elements in plant feeding. What is not so clear, however, is how, when, and in what amounts these other elements are to be included in formulations.

By Vincent Sauchelli

Director of Agricultural Research
The Davison Chemical Corp.
Baltimore, Md.

The problem is, you will all admit, exceedingly complex. These other elements are not generally needed on all soils or crops. And one has to be very careful how he uses them. The toxic potentiality to plants and to animals of some of these elements demands good judgment and knowledge in their application. Boron, for example, can be tolerated in relatively large quantities by certain crops—alfalfa—but in only trace amounts by others—beans. An element such as molybdenum may be tolerated in large amounts by the plant, but such plants having a comparatively high content of the element may prove lethal to grazing livestock. The fertilizer industry has been giving this matter its closest study and has cooperated in every way possible with local experiment stations in preparing fertilizers containing prescribed amounts of one or more of these other elements. But it has made progress slowly and with reason. The industry remembers only too well the costly experience with borax in Maine during World I, and you can't blame it if it proceeds cautiously in its use of these elements.

Why the Present Interest?

Undoubtedly a keen interest exists now in these trace elements. It may be asked, why? Are deficiencies of these nutrients something peculiar to modern farming? Not entirely. Like the poor, they have always been with us. Nature in many places did not provide in the rocks and the soils derived from them a sufficient quantity of all the major and minor nutrients; or if these were present originally, they were reduced too far by leaching and cropping. We know now that lack of one or more of these microelements must have affected plant growth and yields on certain soils, even in Colonial days. The symptoms were observed but the cause was not known. Various explanations based on theories prevalent at the time were given as the cause: the weather, an act of the evil one, a virus, or just plain "disease."

Humans Also

Much the same thing is true about explanations of human abnormalities. The fundamental studies of those early investigators—van Helmont, Priestley, Davy, Liebig—laid the foundations of our present insight into the true causes of the abnormalities symptomatic of nutritional deficiencies. Today we have fairly good diagnostic techniques to aid in recognizing them.

Farming practices prior to World

* Paper presented at New England Fertilizer Conference, New Haven, Conn., February 27, 1950.

War I undoubtedly helped to mitigate the problem, and the changes since then have tended to accentuate it. I refer to the use of animal power on farms with the attendant general use of animal manures and the general use of guanos as sources of plant nutrients. At the turn of the century about 25 million horses and mules furnished animal power on American farms. At present the number has decreased to about 8 million. Gasoline-powered equipment has displaced the beasts of burden. With the animals has gone the manure. That manures do furnish considerable amounts of micronutrients is a well-known fact. According to Dr. J. B. Hester, ten tons of average barn manure (2 tons when dried) contain the following plant nutrients:

Calcium	46.00 lb.
Magnesium	12.00 lb.
Sulphur	6.00 lb.
Iron	15.00 lb.
Manganese	6.00 lb.
Boron	2.25 lb.
Copper	1.10 oz.
Nitrogen	74.00 lb.
Phosphorus	71.00 lb.
Potash	82.00 lb.
Carbon	1,600.00 lb.

According to A. L. Mehring, New England farms produced in 1947 about 16.5 million tons of manure, of which about 9.3 million tons were applied on its soils. Using Hester's analysis, this means an annual application of about 1,040 tons of boron, 2,790 tons of manganese, 2,700 tons of sulphur, 6,750 tons of iron, and 320 tons of copper.

That seems a lot. But let us not be misled. These are averages. Manure is available chiefly to dairy farmers; very little to market gardeners. However, farmers are learning how to grow abundant, high-quality crops by means of commercial fertilizers and good soil-management practices. You don't have to keep cows to grow good crops. This is not to deny, however, that barn manure from grain-fed animals, where it is available, may provide good insurance against severe deficiencies of minor elements.

Type of agriculture also has a definite tie-in with the present awareness of minor element deficiency. Coastal Plain soils adjacent to our large industrial centers are being used for growing vegetable crops. Such soils are, naturally, poorly supplied with micronutrients. Under the intensive system of farming followed by market gardeners on such soils involving heavy applications of refined salts of NPK carriers, it is to be expected that deficiencies will show up. The level of fertility present might satisfy a crop of 4 to 5 tons of tomatoes or 200 bushels of potatoes; but, for the 15 to 20 tons of tomatoes or 500 to 600 bushels of potatoes per acre required by the system to be profitable, the amount of native micronutrients present is entirely inadequate. Another factor is the soil pH. These market gardening soils are usually of a sandy open type and acid. To get high yields the grower has to lime rather heavily and frequently. One effect of heavy liming is to reduce the availability of some of the micronutrients—manganese and copper, for example. These are some considerations which help to highlight the more important reasons stimulating the present interest in micronutrient fertilization.

The Writer of This Article is one of America's Leading Research Workers in The Fertilizer Industry

Minor Elements in Fertilizers

What is the proper place of microelements in commercial fertilizers? may be a fair question at this point of this discussion.

It is not easy to answer. To do so raises many other equally difficult questions.

As mentioned at the beginning, the fertilizer industry and good fertilizer practices are predicated upon a knowledge of the mineral requirements of crops. As cropping becomes more and more intensified, as more synthetic, concentrated plant foods are accepted by agriculture, this basic knowledge becomes more important, especially for highly specialized farming systems and practices.

We recognize now that twelve elements are essential to the growth of higher plants. Each is identified with some problem of crop nutrition. If any one is missing, crop failure results. Other elements besides these 12 are known to produce beneficial effects when applied to special crops. For our purposes, let me suggest grouping these elements into:

(a) A major group, comprising N, P, K, Ca, Mg, S. These elements are needed and are applied in major quantities; hence, are called major elements.

(b) A minor group, comprising Fe, Mn, B, Cu, Zn, Mo, Co. These are required in relatively minor quantities, sometimes in mere traces; hence, are called minor elements.

(c) A group of beneficial elements, comprising Na, Cl, Al, Si. Sodium is beneficial to sugar beets; aluminum to azaleas and similar shrubs; chlorine to grain crops, at least in Europe, silicon seems able to substitute for phosphorus to some extent; and so on.

Let me digress a bit at this point to show what minor elements the fertilizer industry is furnishing agriculture.

Composite Analysis of Commercial Fertilizers

That the fertilizer industry in this country is supplying an appreciable amount of micronutrients in its fertilizers was brought out by a report released some time ago by the U. S. Department of Agriculture, prepared by A. L. Mehring and associates. They collected 44 mixed fertilizers from 16 states. The average chemical composition of 27 complete fertilizers from this group, selected as representative of the total sold in the United States, showed the following items on a percentage basis:

(*Continued on page 28*)

[1] This paper was presented at the United Nations Scientific Conference on the Conservation and Utilization of Resources held at Lake Success, New York, August 17 to September 6, 1949.

WORLD RESOURCES

For Crop Production . . . to Feed the Peoples of Many Lands . . .

BY
K. D. JACOB
Bureau of Plant Industry

AT least fourteen chemical elements are known to be essential for plant nutrition, of which three—nitrogen, phosphorus and potassium—are generally of major concern as regards supplies for crop production. Although research in recent years has shown the need for applications to certain soils and crops of an increasing number of the other nutrient elements—notably, calcium, magnesium, sulphur, boron, manganese, copper, and zinc—the following discussion is limited necessarily to nitrogen, phosphorus, and potassium.

Each of the major sub-divisions of the earth—atmosphere, lithosphere, and hydrosphere—is an economic source of one or more of these three elements. Thus the atmosphere is the principal source of nitrogen, phosphorus comes almost entirely from the lithosphere, and the hydrosphere supplies important quantities of potassium.

Order of Abundance

In the order of abundance among the ninety-odd chemical elements, nitrogen ranks seventeenth, phosphorus twelfth, and potassium seventh. All terrestrial matter contains, however, an average of only 0.03 per cent of nitrogen (N), 0.11 per cent of phosphorus (P), and 2.40 per cent of potassium (K).

Practically all soil contains nitrogen, phosphorus and potassium but the quantities and forms are often such that crops in most of the world's agricultural areas cannot obtain fully their requirements for optimum yields from this source alone. Consequently, the soil supplies of these elements must be supplemented in various ways, including additions of manures, crop residues, and commercial fertilizers. The latter, derived mostly from inorganic sources, are already a major factor in crop production in many parts of the world, and provision of adequate supplies of food for all peoples will necessitate not only continued but greatly expanded use of such fertilizers. The nature and extent of the world resources of plant-nutrient elements, especially nitrogen, phosphorus, and potassium, is, therefore, a matter of primary importance.

Nitrogen

The air over each hectare of the world's surface contains approximately 78,000 metric tons of nitrogen[2] the only fertilizer raw material native to the atmosphere. This nitrogen is present, however, in the elemental form and cannot be utilized directly by plants but first must be combined with other elements by chemical or biological means. It is the basis of the great chemical nitrogen-fixation industry and is by far the most important nitrogen resource. Furthermore, atmospheric nitrogen is the only fertilizer raw material of which every country, regardless of size or location, has an inexhaustible supply.

Fixation of atmospheric nitrogen by the root-nodule bacteria of leguminous plants is a highly important way of furnishing nitrogen to the soil. To supply all the nitrogen requirement of a cultivated crop in this manner is generally, however, uneconomic and impracticable. Resort must usually be had, therefore, to additional means of supplementing the soil resources of nitrogen.

Bituminous Coal

Next to the atmosphere, the most important source of fertilizer nitrogen is bituminous coal, from which it is obtained as a by-product—principally in the manufacture of coke. Each ton of this coking coal contains 15 to 20 kilograms of nitrogen, of which an average of about 2.3 kilograms is recovered as ammonia in modern by-product plants. It is estimated that at least 85 per cent of the world output of coke is made in by-product ovens, but only about 15 per cent of the world consumption of coal is coked. The world's bituminous coal deposits are estimated to contain about 68,300 million tons of nitrogen. On the basis of current coal usage and nitrogen recovery, these deposits are a potential source of some 8,700 million tons of fertilizer nitrogen.

As the use of coke is mostly in the blast-furnace industry, its production, as well as that of coke-oven nitrogen, is governed chiefly

(*Continued on page 28*)

Senator Holland

APFC Convention Plans Announced

• • •

Dr. D. S. Freeman

THE nationally-known author, historian and Pulitzer Prize winner Dr. Douglas S. Freeman of Richmond will be the principal speaker at the Fifth Annual Convention of the American Plant Food Council to be held at The Homestead, Hot Springs, Virginia, June 29–July 2, according to an announcement by Clifton A. Woodrum, President of the Council.

Dr. Freeman will speak before some 400 members and guests at the annual banquet session, Saturday evening, which will highlight the Convention. He holds Doctor's degrees from more than 20 of the Nation's leading Colleges and Universities and has served as a trustee of the Rockefeller Foundation, on the General Education Board of the Carnegie Endowment for International Peace and on the Woodrow Wilson Foundation. For his four volumes on Robert E. Lee in 1934, he was awarded a Pulitzer Prize. In addition to being honored by many institutions of higher learning, he has been active on Boards and Committees of nationally-known educational, historical and social organizations.

Opens Friday

The Convention sessions will formally begin Friday, June 30 with the welcome address by Mr. Woodrum. U. S. Senator Spessard L. Holland, (D-Fla.) member of the Senate Committee on Agriculture and Forestry will give the feature address.

Senator Holland, a former Governor of Florida, received his Ph.B., magna cum laude, from Emory College in 1912; LL. B., from University of Florida in 1916; honorary LL. D., from Rollins College in 1941, Florida Southern College in 1941 and Emory University, 1943. He served as a prosecuting attorney, county judge and was a member of the Florida State Senate. Coming from a State noted in particular for its phosphate industry, Senator Holland is regarded as a well informed man in the field of fertilizer.

W.R. Thompson, Associate Leader, Extension Agronomy, Mississippi State College at State College, his alma mater, will follow Senator Holland with an address on "Plant Food and Pastures."

Well-known throughout the South as "the pasture man," Mr. Thompson has attracted widespread attention as a lecturer and leader with a down-to-earth approach to the problem of grassland farming in a sound agricultural program.

Appointment of Convention Committees, a brief business session and the election of nine members to the Board of Directors will conclude the opening day session.

Six Winners

The six national winners in the 1950 essay contest on "Soil Fertility and the Nation's Future" will receive their awards Saturday morning, July 1 from Assistant Secretary of Agriculture Knox T. Hutchinson, Chairman of the National Board of Judges.

Mr. Hutchinson came to the Department of Agriculture from Murfreesboro, Tenneesee, where he operates a 550-acre diversified farm. Before engaging in farming, he taught agriculture at the Teacher's College at Murfreesboro. In 1921 he received a bachelor's degree in agriculture from Peabody College and later did graduate work at Vanderbilt University, the University of Pennsylvania and the University of Tennessee. He was a member of the Tennessee State Senate from 1939 to 1940, served as Chairman of the Executive Board of the Tennessee State Grange and has been a Director of the Rutherford County Farm Bureau since 1936.

Other National judges for the contest are: Dr. Hugh H. Bennett, Chief, Soil Conservation Service, U. S. Department of Agriculture: Miss Lois M. Clark, Assistant Director, Division of Rural Service, National Education Association; Dr. W. T. Spanton, Chief, Agricultural Education Service, U. S. Office of Education and Dr. M. L. Wilson, Director of Extension Work, USDA.

Sponsored by the National Grange and American Plant Food Council, the 1950 contest attracted more than 20,000 essays from young men and women in the 48 States and District of Columbia. Albert S. Goss, Master of the National Grange is scheduled to speak in connection with the awards which total $10,000.

National prizes in the contest are: First, $1,000; Second, $500; Third, $400; Fourth, Fifth and Sixth each $300. The National winner, to be selected in June, will read his or her paper as a feature of the presentation ceremonies.

On July 2, the Council's Board of Directors will meet to elect an Executive Committee and a new Committee Chairman. AMERICAN FERTILIZER will give full news and picture coverage of all phases of the meeting.

(Continued on page 32)

WHERE ARE WE GOING???

By George H. Serviss, Agronomist, G. L. F.

AFTER spending 25 years in fertilizer work, first as research agronomist, next as extension agronomist and finally as agronomist for the fertilizer and chemicals division of a farm cooperative, it is interesting to look briefly back at the past, but more interesting to try and guess the future. If one wishes to keep up with what is happening in the field of fertilizer usage and manufacture today, though, it is not wise to spend too much time on the past. The present offers plenty and the future, no doubt, more. The fertilizer industry today is part of the chemical industry and the chemical industry is moving fast.

Over the past few years a tremendous increase in fertilizer usage has occurred. Part of this has, no doubt, been due to very favorable price relationships, not just between fertilizer and the crops the farmer sells, but between fertilizer and the cost of other production items such as labor, machinery, etc. Fertilizer has been a good buy and high acre yields have been a necessity to keep unit production costs low, so it has paid to fertilize liberally. The peak of use is not here, but we are likely to have some downswings before we reach it.

Plant Breeders

The plant breeders have made substantial contributions to fertilizer use by giving us superior varieties of many crops. Varieties that have higher yielding capabilities, better quality, disease resistance, better standability, etc., all of which with one crop or another assures the farmer of greater returns for his fertilizer dollar. The entomologists and pathologists, with the aid of chemists, have given us improved insecticides and fungicides. With better insect and disease control, yields have shot up, which in turn has meant increased usage of fertilizer per acre. Irrigation also is rapidly expanding in the humid east and our ideas on fertilization may have to change with it. We are in for some changes, some of which may be quite rapid. For those who like the "status quo" there are likely to be some headaches, but those who like change will no doubt get it and probably some headaches also.

Agricultural science groped in the dark for many years by hit or miss methods and a great deal of progress was made in this way, but it was slow. Agriculture science, though, is no longer groping totally in the dark; it has much better tools with which to work and a fund of knowledge to start from. The plant breeder today, for instance, knows his "genes" and no longer makes his crosses blindly. He knows which crosses are likely to give him what he wants and which are not. Anyone interested in fertilizer usage should be fully as much interested in plant breeding research as in fertilizer research. Fertilizer usage is dependent on varieties that will give good returns for the fertilizer used in the production of the crop. While we hear considerably about "surpluses" of certain crops today, with our increasing population we are going to need more total production a few years hence if we wish to better the American standard of diet.

Human and animal nutrition are both much in the public eye today. There is a lot of guessing going on, much research, and a lot yet to be learned . . . . In this fine article George Serviss asks a few questions. What do you think?

Today's Approach

Today it seems to me that our agronomists and others concerned with fertilizer research are taking a sounder approach to fertilizer usage problems than was the case some years ago. This research is now aimed at finding the kind, amount and method of application that will enable the farmer to secure maximum net returns per acre. There was a time when we evaluated fertilizer usage on the amount that gave the greatest returns per dollar invested in fertilizer and ignored many other important factors. One dollar's worth of fertilizer applied in the hill for corn may give a big return on the investment, but still leave the farmer with an unsatisfactory crop. Ten dollars might give less return per fertilizer dollar, but a far more profitable crop. In other words, yields might be increased sufficiently to substantially lower those costs per bushel that do not change much on an acre basis irrespective of the yield. There is still much to learn about rate, kind and placement and the final answer, if we ever get it, will not be the same for all crops on all soils.

Soil testing is something that anyone connected with fertilizer

(*Continued on page 26*)

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Table of Contents

Front cover illustration shows a portion of the laboratory of the Virginia-Carolina Chemical Corporation, Richmond, Va. Photo courtesy of the American Plant Food Council.

SALES . . .

In Boston two weeks ago one of the fertilizer experts with a northern state college was talking at random about the problems of the fertilizer industry.

"I think the mistake is being made by the fertilizer manufacturers in not educating company salesmen on their job," he said, over a cup of coffee. "I also think that this lack of knowledge results in a lack of sales, and a lack of interest in the product the person is selling."

He's right.

Up and down the highways of America are traveling some of the most misinformed men in any business—the fertilizer salesmen. They are not sure of this and that, they cannot talk too intelligently about the new ideas in the field, and they always say, "I'll write the office and find out about that."

And it is not their fault, for the information is pigeon-holed somewhere in the main office, and the new ideas are in a bulletin that was filed in the "round file" last month. When they do write in the letter is answered in a few weeks instead of being answered the day it hits the desk of the research department.

Perhaps the above comments do not apply to your company or to your salesmen, but it hits somebody somewhere and so it does need to be thought about. One swallow does not make a summer, and one good company does not make a good industry.

As we have written before in this space, the fertilizer folks should begin now to tell and sell the American public on the real need for increased fertilizer usage, because the sales "gravy train" is no longer running and the men on the road are coming more and more back into the picture as "key men" in the scramble to stay on top of the sales picture and in line with competitive costs.

Hustle and tussle time is with us once again, and while fertilizer is in the bag—business isn't.

Give your salesmen the knowledge and whet their interest and they'll make the black line on the sales graph climb steadily.

WOODS NAMED PRESIDENT OF COMMERCIAL SOLVENTS

J. Albert Woods was elected president of Commercial Solvents Corporation at a special meeting of the board of directors, it was announced on April 12th by Major Theodore P. Walker, chairman of the board. He succeeds the late Henry E. Perry.

In making the announcement, Major Walker said: "I have known Mr. Woods for many years and have the highest regard for his business ability and his technical background

J. Albert Woods

in the field of agricultural chemicals, a field in which Commercial Solvents is very active. Mr. Woods, who is a director, is ideally suited to head our company in its future growth."

For many years Mr. Woods has been active in the agricultural chemical field, with experience in both production and sales. Prior to coming with Commercial Solvents, Mr. Woods was president of Wilson & Toomer Fertilizer Company, manufacturers of heavy chemicals, fertilizers and insecticides. He has also been a vice-president and a director of the Armour Fertilizer Works, president of Chilean Nitrate Sales Corporation, and a vice-president of W. R. Grace & Company.

In a statement issued after the meeting, Mr. Woods said: "As a director of the company I am familiar with the activities of the corporation, its problems and promise for the future. I feel it is an exceptional opportunity to head the company at this time when activities in the Agricultural Chemicals Division are being expanded. I also feel that the Pharmaceutical Division offers tremendous possibilities for future development. In my opinion, the big growth industry of the next ten years will be the chemical industry."

MORGANTOWN PLANT OFFERED FOR LEASE

The mammoth synthetic ammonia plant of the U. S. Army at Morgantown, W. Va., is being offered for lease. Bids will be opened on May 15th at the office of the Army Engineer Corps, Louisville, Ky.

The Morgantown plant is one of the biggest of the Army's nitrogen projects, having a capacity of 18,000 tons of anhydrous ammonia per month. During the war, it was operated by E. I. duPont de Nemours & Co. For the past several years, it has been operated for the Army by the Heyden Chemical Corporation.

AWARDS ANNOUNCED ON KOREAN NITROGEN BIDS

After a consideration of the bids, opened on April 3rd, for the Korean-ECA 12,000 ton nitrogen supply, as reported in the April 15th issue of AMERICAN FERTILIZER, the Federal Service Supply has awarded the contracts to three of the bidders.

C. B. Fox Company, of New Orleans, La., will supply 6,000 tons of nitrogen, to be produced at the Austria Nitrate Works, Linz, Austria, and to be shipped from Trieste.

U. S. Steel Export Corporation will furnish 2,300 tons of nitrogen, shipment to be made from Baltimore, Md.

Nitrogen Products, Inc., was awarded 4,600 tons of nitrogen, shipped from Baltimore and New Orleans.

Shipping schedules call for delivery of 8,900 tons by May 15th and the balance early in June.

SMITH TO HEAD PACIFIC CHEMICAL & FERTILIZER CO.

Ronald Q. Smith was elected to the office of president by the directors of Pacific Chemical & Fertilizer Company, of Honolulu, Hawaii, at a meeting on April 6th. Mr. Smith, who was formerly general manager of the company, succeeds James T. Phillips, who was named chairman of the board.

At the same meeting William G. Hewitt, assistant general manager, and Gordon B. Hayes, treasurer, were appointed vice-presidents. Mr Hewitt, who has spent about two years in the San Francisco office, will return to Honolulu in June. Mr. Phillips will make his headquarters in San Francisco for the next six months.

At the annual meeting of stockholders, Mr. Smith was also elected to membership on the board of directors.

India Reports Fertilizer Expansion

From India come reports to AMERICAN FERTILIZER of the recent agricultural - industrial advancements being made. Fertilizer is becoming more and more important to the rapidly growing country and two recent news items point up this fact.

The Sindri fertilizer factory in Bihar is expected to be ready by August this year. The factory will produce about 350,000 tons of fertilizer every year. Since February 18 about 500 tons of gypsum have been moved from Rajputana every day to the Sindri factory About 30 Indian experts who are to work in the factory have almost completed their training in Britain and the United States.

India will import 500,000 tons of chemical fertilizers for the year ending June, 1950. Of this quantity 138,175 tons have already been received. The Indian factories produced 54,168 tons of fertilizers during July-December, 1949, and their estimated production during January-June, 1950, is 68,800 tons. Fertilizers imported in 1949-50 were valued at $30,765,000.

MARCH TAX TAG SALES

Fertilizer tax tag sales, as compiled by The National Fertilizer Association, totaled 1,829,000 equivalent short tons during the month of March. This, the second highest March total on record, fell short of the March, 1949, figure by some 94,000 tons or about 5 per cent.

Of the 13 States included in the tabulation, five—including two of the three Midwestern States—reported greater equivalent tonnages than a year ago. During the first quarter of the current year, total tag sales were approximately 10 per cent below those of the same period of 1949, although sales in Florida, Louisiana and each of the Midwestern States surpassed those of a year earlier.

CARPENTER NAMED MATHIESON EASTERN SALES MANAGER

A. H. Carpenter has been appointed eastern sales manager of the Agricultural Chemical Division of Mathieson Chemical Corporation, according to S. L. Nevins, vice, president, director of agricultural chemical sales.

Mr. Carpenter succeeds Joseph S. Whittington who has been transferred to the executive offices of the agricultural chemical division, where he will devote his time to research and development work.

Widely known in the fertilizer industry, Mr. Carpenter was with Baugh & Sons Company prior to his Mathieson appointment.

A native of Madison County, Virginia, he served in the U. S. Army Air Corps in the First World War. In 1920 he joined the Armour Fertilizer Works where he held the position of vice-president and general sales manager when he left them to go with Baugh in 1947.

Mr. Carpenter now lives in Taneytown, Md., where he operates a farm.

A. H. Carpenter

FERTILIZER TAX SALES AND REPORTED SHIPMENTS

(In Equivalent Short Tons)

COMPILED BY THE NATIONAL FERTILIZER ASSOCIATION

State	March		Calendar Year Cumulative January-March		Fiscal Year Cumulative July-March	
	1950	1949	1950	1949	1949–50	1948–49
Virginia	125,578	141,575	306,552	340,025	494,980	530,931
N. Carolina	322,102	333,876	693,255	957,822	884,007	1,421,760
S. Carolina	190,018	246,566	546,628	617,600	746,772	853,540
Georgia	332,172	380,792	690,198	747,888	907 411	1,007,251
Florida	85,158	88,699	346,509	329,272	815,138	677,446
Alabama	196,178	193,824	348,278	441,900	513,795	628,264
Tennessee	57,304	60,803	100,283	123,698	201,326	265,270
Arkansas	56,627	50,064	98,191	116,674	165,609	205,082
Louisiana	60,628	52,523	117,217	113,478	173,661	182,899
Texas	93,719	106,513	201,961	197,656	417,610	406,962
Total South	1,519,484	1,655,235	3,449,072	3,985,413	5,320,309	6,179,405
Indiana	124,727	97,221	296,924	230,914	702,343	737,989
Kentucky	99,928	71,468	254,304	252,203	420,351	463,532
Missouri	84,869	98,886	218,735	215,192	386,719	400,948
Total Midwest	309,524	267,575	769,963	698,309	1,509,413	1,602,469
Grant Total	1,829,008	1,922,810	4,219,035	4,683,722	6,829,722	7,781,874

MONSANTO MARKETS COMPOST

An organic compost similar to forest humus is being marketed by Monsanto Chemical Company's Norfolk plant. This new material is a vegetable product which improves soil texture and gives better moisture-holding capacity. It also provides food for soil bacteria, earthworms, etc. which convert the product into humus. The compost, which has a pleasant odor, is sold in 100-lb. bags.

FERTILIZER MATERIALS MARKET

NEW YORK

Carry-over into New Season Expected for Sulphate of Ammonia and Superphosphate. Prices of Some Organics Decline. Potash Situation Easier with Increase of Imported Material. No Prices for Next Season's Contract Materials Announced to Date.

NEW YORK, April 26, 1950

Sulphate of Ammonia

While some additional export business has been done, many domestic coke producers find they have considerable stocks of this material on hand which they may have to carry over to the new season. While no price changes are reported, most people in the trade look for some price reduction for the new fertilizer season.

Nitrate of Soda

The movement of this material is reported as better as the top dressing season approaches. Stocks seem to be adequate for the present demand.

Ammonium Nitrate

This material is moving well against contracts and several large export inquiries in the market for quick shipment were not filled. No price changes were noted.

Nitrogenous Tankage

Some producers were sold up into the summer and demand continued good for this material. Prices asked by most producers were $4.00 per unit of ammonia ($4.86 per unit N), f.o.b. shipping point.

Castor Pomace

Producers continue to be well sold up and the production of this material is not as large as last year. Last sales were made on the basis of $30.50 per ton, f.o.b. production points. Demand continues good from most sections.

Organics

The price of blood again declined, due to slow demand from the feed trade and the fact that the fertilizer season was over in some sections. Blood sold in the East at $6.50 per unit of ammonia ($7.90 per unit N), f.o.b. shipping points and some material sold at Chicago at $6.25 ($7.59 per unit N). Animal tankage sold at $7.25 ($8.82 per unit N), and interest seemed to be a little better for this material. Soybean meal continued to sell at $61.00 per ton, f.o.b. Decatur, Ill., in bulk for prompt shipment. Cottonseed meal sold at $63.00 per ton, f.o.b. Southeastern points. Linseed meal for nearby shipment was firm and some mills were sold out entirely for April shipment.

Fish Meal

This material was slow and in rather poor demand under the influence of increased offerings of imported material which has been arriving at various Atlantic ports. A small amount of menhaden fish scrap has been reported sold at $130.00 per ton, f.o.b. fish factories, on a "when and if made basis" but many buyers think the price will work lower during the summer months.

Bone Meal

A better demand was noticed for the fertilizer grade but demand from the feed trade was poor for feeding bone meal. Prices in some cases for feeding bone meal were lower.

Superphosphate

While the movement of this material is better in most sections, it is thought there may be quite a carry-over at some production points. Triple superphosphate is still in demand for nearby shipment.

Potash

This whole situation is gradually easing up under the influence of the late season and the fact that the season is already over in certain parts of the South. A considerable quantity of European material has recently arrived at various Atlantic ports, which has helped the supply situation. Prices for the new season have not as yet been announced by the domestic producers.

PHILADELPHIA

Materials Market Quiet. Supply Adequate for Most Materials. Potash Situation Improving.

PHILADELPHIA, April 26, 1950

The general raw materials market is rather quiet with no unsatisfied demands except probably for triple superphosphate and castor pomace.

Sulphate of Ammonia—Supply is reported to be sufficient to meet requirements but the demand is somewhat lax. Buyers are hoping for a price reduction, but justification for it is not too apparent. The recent export movement has reduced stocks.

Ammonium Nitrate—Production is mostly under contract and demand for shipments continues strong.

Nitrate of Soda—Demand is rather active for top dressing but stocks are sufficient to meet all requirements.

Blood, Tankage, Bone—Market is weak and there is very little buying interest. Blood sold for $6.75 per unit of ammonia ($8.20 per unit N), and tankage at $7.50 to $8.25 ($9.12 to $10.02 per unit N), depending on location. Domestic bone meal is meeting strong competition from imported material, with demand slack.

Castor Pomace—Production remains under contract, with no new offerings in the market.

Fish Scrap—Market very quiet. Menhaden quoted at $137.50 to $140.00 for 60 per cent meal, and scrap at $130.00. Imported fish offers strong competition.

Phosphate Rock—Movement reported normal and fairly satisfactory for this time of the year. Stocks are

amply sufficient to meet demand, and no price changes are reported.

Superphosphate—Price of triple superphosphate was reduced earlier in the month and demand for this grade is somewhat ahead of the supply, although production seems to be up. Production of normal is behind last year, and seems to be well under contract, with movement about even with demand.

Potash—Production and shipment of domestic are said to now be on a fairly normal basis. Most of the foreign potash purchased for this spring has arrived, with the possible exception of some Russian now afloat. It is reported that some mixers overbought considerably, and their position is now just the reverse of what it was a few months ago.

CHICAGO

Organics Market Unchanged. Movement of Materials Slow and Future Trends Uncertain.

CHICAGO, April 24, 1950

The Midwestern market on animal ammoniates remains practically unchanged. However, the movement of material is extremely slow and the market appears to be leaning somewhat toward easiness. The need of a broader demand is still felt in order to sustain present values.

Meat scraps, ground and sacked, 50 per cent protein, are still listed nominally at $105.00 to $110.00 per ton and digester tankage 60 per cent protein at $100.00 to $105.00 per ton. These prices still prevail in the Chicago area but on the outside buying interest in both cases is limited to bids of $100.00 per ton delivered. Dry rendered tankage is still generally held at $1.90 per unit of protein delivered, but some trading is reported at $1.85 and in other cases bids submitted are not over $1.80. Wet rendered tankage is quoted at $7.50 to $8.00 per unit of ammonia ($9.12 to $9.72 per unit N) for high testing product and $8.50 to $9.00 ($10.33 to $10.94 per unit N) delivered for low test material.

Dried blood last sold at $6.00 per unit of ammonia ($7.29 per unit N), delivered and further quantities are available at this price. Steamed bone meal in bags, 65 per cent B.P.L., is listed at $70.00 to $75.00 per ton and raw bone meal, 4½–45 per cent at $65.00 to $70.00 per ton.

CHARLESTON

Little Change in Market. Demand Continues Good and Supplies Ample on Most Materials.

CHARLESTON, April 24, 1950

Potash for interior manufacturers continues short of demand, with most Atlantic coast port manufacturers comfortable on account of imported supplies. Normal superphosphate is generally adequate in supply except in isolated areas where shortages have developed. Mineral nitrogen is generally adequate in supply. Organic ammoniates are being sold for shipment during the new season at prices generally higher than during the previous season.

Organics—The market on organics for prompt shipment is quiet, with demand and supply more or less in balance. Domestic nitrogenous for summer and fall shipment has been sold at prices ranging from $3.70 to $4.10 per unit of ammonia ($4.49 to $4.98 per unit N), in bulk f.o.b. production point, depending on its location. Blood and tankage are relatively quiet and still priced too high for most fertilizer manufacturers' use. Limited quantities of imported nitrogenous have been sold for summer and fall shipment at $4.65 and $4.75 per unit of ammonia, ($5.65 and $5.77 per unit N), in bags c.i.f. Atlantic port, but offerings in the market are scarce.

Castor Pomace—Last sales were made at $30.50 for summer shipment in bags, f.o.b. Northeastern production points. No new offerings are in the market and movement is against previous contracts.

Dried Ground Blood — Chicago market is around $6.00 per unit of ammonia ($7.29 per unit N), in bulk delivered Chicago area. The New York market is around $6.75 per unit of ammonia ($8.20 per unit N), with interest quiet.

Potash—Market continues tight with demand greater than producers can furnish, even though they are operating at full capacity. Good supplies of imported material are arriving during April at Atlantic ports.

Ground Cotton Bur Ash—Shipments continue heavy against existing contracts for material testing 30 per cent to 40 per cent K_2O and 3 per cent to 4 per cent chlorine. Current price for ground material is around 65 cents per unit of K_2O in bulk, f.o.b. Texas production point. Unground material is available at around 60 cents per unit of K_2O in bulk.

Phosphate Rock—Demand continues satisfactory and shipments are moving from stocks above ground. Prices continue firm.

Superphosphate—Demand is good and in certain areas shortages of normal grade have developed. Triple superphosphate is in tight supply with demand heavy.

Sulphate of Ammonia—Producers of synthetic material are in heavily sold position but supplies of coke oven material appear adequate to meet the demand. Price outlook for the new season is uncertain.

Ammonium Nitrate—Market is tight for both imported and domestic production. No changes in prices have been noted.

Nitrate of Soda—Demand is steady and supplies fully adequate with prices unchanged.

ENGLISH SOCIETY STUDIES U. S. FERTILIZER METHODS

The Fertilizer Society of London, England, at its meeting held on April 21st, devoted its program to a discussion of fertilizer production and research methods in the United States. R. M. Collins presented a paper entitled "The Mining and Preparation of Florida Land Pebble Phosphate," which was followed by a film showing the Florida operations of the International Minerals & Chemical Corporation. At the afternoon session, John O. Hardesty and Kenneth G. Clark, of the U. S. Department of Agriculture presented a paper on fertilizer technology research as carried on in the USDA. Both papers were followed by general discussion from the assembled fertilizer executives and technicians.

Here's how this *Customized* Baughman

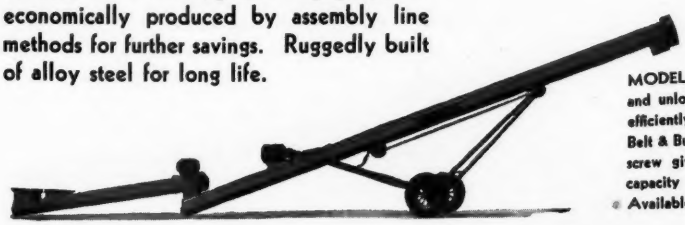
BULK HANDLING EQUIPMENT

Makes more money for you

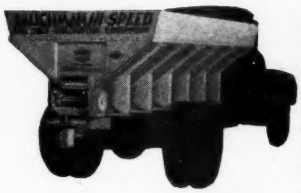
Sell for less—eliminate bagging by handling in bulk and delivering in bulk. It's the most practical, the most efficient way to handle commercial fertilizers.

BAUGHMAN Equipment gives you automatic material flow direct from car to storage bin or hopper bin . . . from storage bin to hopper bin for delivery. Cuts man hours to the minimum.

LOW COST. Build your Belt and Bucket Elevator (right) from standard 10′ sections . . . eliminate the expense of a custom-built installation. All Baughman equipment is economically produced by assembly line methods for further savings. Ruggedly built of alloy steel for long life.

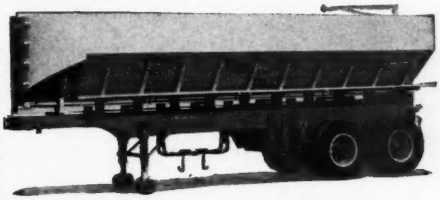


MODEL Q SCREW CONVEYOR loads and unloads cars and trucks quickly and efficiently—the perfect teammate for the Belt & Bucket Elevator! Big 9″ conveyor screw gives up to 40 bu. per minute capacity from the horizontal to 50°. Available with or without wheels.



WRITE . . . for complete details.

MODEL K . . . the famous self-unloading body used by commercial operators the world over to spread lime, phosphate and other materials. Spreads large volumes at high speed. Built of high tensile alloy steel for more strength with less weight—MORE PAYLOAD! Available with sprayer attachment to prevent wind loss and hold the spread to the ground . . . also specialized rock phosphate spreading attachment.



SUPERPHOSPHATE TRANSPORT gives high speed, low cost bulk handling. Effectively hauls and unloads superphosphate. Waterproof roof can be installed. Baughman also builds bodies for rock phosphate, limestone and other commercial fertilizers. A model for your every need.

BAUGHMAN

BAUGHMAN MANUFACTURING CO., Inc.

243 Shipman Road JERSEYVILLE, ILLINOIS

"The Pioneers of the Lime Spreading Industry"

NEW PAYLOADER ADDED TO HOUGH LINE

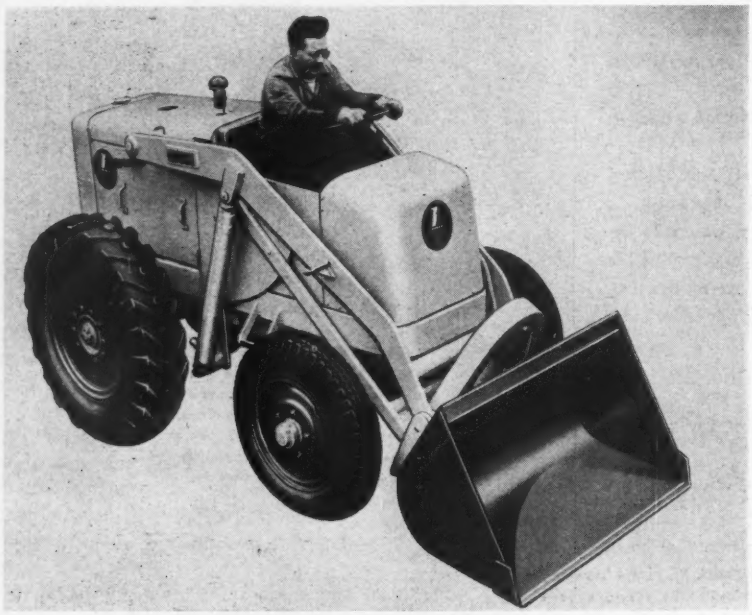
A new ½-yard Payloader tractor shovel has been recently put on the market by the Frank G. Hough Co. This shovel, which has been designated as Model HE, has a great variety of uses inside and outside fertilizer plants. In addition to handling bulk materials, it can be used to load trucks, grade and level earth, remove snow, etc.

Like other Payloaders, the Model HE is a complete Hough-built tractor-with-shovel, expressly designed for tractor shovel work. It has a full-reversing transmission with four forward and four faster reverse speeds coupled with forward-reverse control separate from the regular gear shift. This system assures speedy shifting into reverse and speed in reverse.

Ball bearing steering, hydraulic brakes, comfortable operator seating and operator location for full visibility of all operations are also valuable features contributing to the speed, maneuverability and versatility of this new Payloader. Full dumping clearance of 91 inches is provided so as to load trucks easily. Its capacity for dumping and closing its bucket hydraulically dump loads slowly or abruptly as desired; also dumps them precisely and accurately. This feature saves truck springs and bodies from shock and damage, speeds loading cycles and enables trucks to be heap-loaded without spillage.

The Payloader line now includes tractor shovels with bucket capacities of 12 cu-ft., ½-yard, ¾-yard, 1¼-yard, and 1½-yard.

Literature and other details on this new Payloader can be secured from any Hough distributor or by writing to The Frank G. Hough Co., 704A Sunnyside Avenue, Libertyville, Illinois.



Hough Model HE Payloader

FEBRUARY SULPHATE OF AMMONIA

The effects of the recent coal strike were reflected in the production of by-product sulphate of ammonia during February, according to the figures of the U. S. Bureau of Mines. A production of less than 50,000 tons from by-product ammonia represents a decrease of almost 27 per cent from January and about the same drop from February, 1949. Shipments topped production by about 8,000 tons, decreasing stocks on hand at the end of February to 85,597 tons. This, however, is more than 4 times as much as was available on February 28, 1949.

	Feb. 1950 Tons	Jan. 1950 Tons	Feb 1949 Tons
Production			
Sulphate of Ammonia			
By-product	49,871	68,088	67,810
Purchased Am.	3,544	3,242	4,146
Ammonia Liquor	1,555	2,078	1,965
Shipments			
Sulphate of Ammonia			
By-Product	57,633	44,200	72,029
Purchased Am.	3,320	3,254	4,238
Ammonia Liquor	1,282	1,216	1,342
Stocks on Hand			
Sulphate of Ammonia	85,597	93,454	21,041
Ammonia Liquor	664	879	695

The Cat WITH NINE BILLION LIVES

First in a Series of Advertiser Stories

SOME trade marks are born on the drawing board, the product of careful thought. Some of them just sort of happen. The "Cat-In-The-Bag" trade emblem of Bemis Bro. Bag Co. is one of those that just sort of happened—66 or more years ago.

The cat destined to achieve this limited form of immortality lived, just as the Civil War was getting under way, in a home at 2132 Wash Street in St. Louis. She was owned by one Miss Annie Fyfe, a forelady in the cotton department of Bemis, Brother and Company—a bag manufacturing firm that had not yet celebrated its 25th year when, in 1882, Miss Fyfe brought her cat to the factory to live and catch the mice which abounded.

This cat—she probably had a name, but it is forgotten—made herself at home in the factory and became a common sight lying in wait for a mouse, basking in the warmth of the boiler room, or at play among the bolts and bales. One day she was exploring the inside of an empty bag lying on the floor and, upon emerging, she struck the pose which has become so familiar as the Bemis "Cat-In-The-Bag." For this brief pose was noticed by Judson Moss Bemis, founder of the company, and inspired the trade mark that has appeared countless millions of times on Bemis bags, on letterheads, in advertising—even in motion pictures, which were undreamed of when this tabby still lived.

After the peering-out-of-bag episode, the cat apparently decided her destiny had been fulfilled. First thoughtfully providing a litter of kittens to carry on with the mousing work, she departed one December night and was lost to human sight for several months. Only another cat could imagine where she had gone, how many of her nine lives she expended in the byways of St. Louis.

Finally, her solitary adventure at an end, the original Bemis cat returned to her first home and domesticity, showing up unannounced at the house at 2132 Wash Street. Here she peacefully lived in her declining years, making it a habit on cold nights to sleep in the oven of the old iron cookstove in the kitchen.

So much for the romantic history of the Bemis trade mark. As far as is known, the celebrated cat first appeared in an advertisement in the May 30, 1884, issue of The Northwestern Miller. The cat appearing in the early advertising was young; obviously a kitten bent on mischief. But in passing years she has matured and in the emblem as it is used today a sedate, dignified cat calmly looks out at the world from every Bemis advertisement and from most Bemis bags.

NITRATE BUREAU ISSUES BOOKLET ON CHILE

The Chilean Nitrate Educational Bureau, Inc., New York City, has recently published an attractive 72-page booklet entitled *Industrial and Economic Progress in Chile.*" It offers a new and stirring picture of Chile and its friendly people. In graphic style, it sketches the history of the country and its epic struggle for independence. Vivid descriptions of Chile's vast mineral and agricultural resources, its cities and industries, its educational and social progress and its unsurpassed opportunities for year-round outdoor life, lend interest and charm to the life-story of our sister republic.

The 120-year-old nitrate industry, which together with copper, provides Chile with two outstanding contributions to international trade, is described in some detail, with emphasis upon the progressive modernization of mining and refining processes in the production of nitrate of soda and iodine, its principal by-product. A feature of this chapter is the description of the new solar evaporation process in which the energy of the sun is harnessed to replace the sources of power employed heretofore in the nitrate industry.

To many, the chapters dealing with the role of the minor elements in plant, animal and human nutrition will be of special interest. The nutritional functions of plant food elements and the manner in which they are used in the fertilization of various crops grown in the United States under present day conditions are simply but adequately explained.

EIGHT-YEAR STUDY OF TUNG FERTILIZATION

Fertilization of tung trees has increased yield, hastened growth and added materially to orchard profits in 8 years of testing by the Mississippi Experiment Station as a part of the agricultural research program of the state.

In the long-range study, four groups of four trees each received no fertilizer. A like number of trees was fertilized annually with ¼ pound 8–8–4 per tree for each year of age the tree had attained. Other trees were fertilized at a ½-pound and a one-pound rate.

Without fertilizer, the tung trees in 1948 averaged a profit of $22.85 per acre. Fertilized at the one-pound rate, which cost $9.76 per acre the, the profit was $43.76. The 1948 price of tung nuts was $52 per ton, a figure considerably below previous years. Higher prices a few years ago caused profits from fertilized trees to go as high as $95 per acre.

Reporting the result, W. W. Kilby, Station Horticulturist, said:

"Heavier fertilization not only results in higher oil content of fruit and more vegetative growth the same year it is applied, but produces a larger, healthier tree. Larger yields of better nuts per acre reduce production and marketing costs, increasing profits. Eight years of study here indicate that profits due to fertilizer are multiplied year after year."

The Experiment Station recommendation for fertilizing tung trees is as follows:

Apply one pound of fertilizer per tree at planting time, and increase by one pound each year up to maximum 1,000 pounds per acre. Use 6–8–4 the first three years; thereafter 12–8–8 or its equivalant. Fertilize newly-planted trees in the spring, working the fertilizer in within 15 inches of the trunk. For established trees, the fertilizer should be worked in the area beneath the outer spread of the branches between January and blossom time. The phosporus and potassium may be appled to a leguminous cover crop at planting time.

BLUE MOLD THREAT SERIOUS IN SOUTH

In the Deep South the insecticides are again saving the day as the battle against blue mold continues.

Tobacco growers in the flue-cured area are advised to start spraying at once to control blue mold. S. B. Fenne, plant pathologist at V. P. I., says the disease has been reported in nearby North Carolina counties, and that there is constant danger of spread.

Long-range weather forecasts indicate below normal temperatures and above normal rainfall through the middle of May—ideal for blue mold spread, Fenne says.

Burley and dark tobacco growers should start spraying when the plants are the size of a dime, or when blue mold is within 25 miles.

The recommended control material, ferbam, is being sold under at least five trade names—fermate, karbam black, ferradow, nu-leaf and niagara carbamate. There is another material, zineb, sold under the trade names of parzate and dithane Z-78.

A perfect ear of corn or a quality multi-wall paper shipping sack doesn't just happen. It is the result of experience and knowing how

RAYMOND MULTI-WALL PAPER SHIPPING SACKS, the perfect containers for fertilizers, are the result of years of paper sack making experience. For more than fifty years the Raymond Bag Company has specialized in the production of quality paper sacks for the building trades, ceramic industry, chemical industry, and food products manufacturers. If it's a crushed, powdered, or granulated material, it packs and ships better in a RAYMOND MULTI-WALL PAPER SHIPPING SACK.

If you're a producer, packer, or shipper of fertilizer, take advantage of Raymond's experience. Let Raymond solve your container problems.

Raymond Fertilizer Shipping Sacks are CUSTOM BUILT in various sizes, types, and strengths—printed or plain.

THE RAYMOND BAG COMPANY
MIDDLETOWN, OHIO

RAYMOND *MULTI-WALL*
PAPER SHIPPING SACKS

NEW FILLING MACHINE BY ST. REGIS PAPER

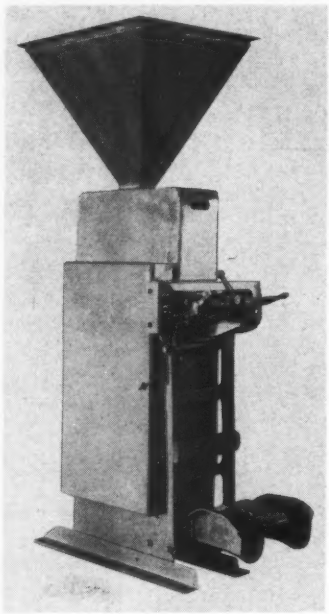
A new automatic packer for filling multiwall fertilizer bags has been developed by the Engineering & Machine Division of St. Regis Paper Company and designed to supplement the company's faster 160-FB fertilizer packer.

The new packer, known as the 325-PB, embodies the filling principles of the 160-FB and is expected to meet the needs of smaller fertilizer plants.

The two fertilizer packers round out St. Regis' line of filling machines to meet the packaging requirements of large and small fertilizer producers. Although designed principally for fertilizer, the 325-PB can be used for other products capable of being handled by the belt filling principle.

The first 325-PB packers have been installed by C. R. Curtis, at Marion, N. Y.; Terre Company, Roselle Park, N. J., and Heeman Manufacturing Co., Wooster, Ohio. Ten additional units are being built by the Engineering & Machine Division of St. Regis.

On the basis of field operations, the 325-PB packer in average production will fill seven to eight 100-pound multiwall paper fertilizer bags per minute with one operator, or between 20 and 24 tons of fertilizer an hour. By mounting two 325-PB packers in tandem (operated by two men) connected to a common bag discharge conveyor, a minimum of 40 tons of fertilizer can be handled per hour, or 13 to 14 100-pound bags a minute. A single 160-FB packer can fill up to 36 tons an hour with one operator.



St. Regis 160-FB Packer

Basic difference between the St. Regis 160-FB and the new 325-PB, besides the capacities of the packers, is found in the weighing system. The 160-FB simultaneously fills and weighs fertilizer while the 325-PB pre-weighs the fertilizer charge before it is transported by belt into the bag. The 325-PB packer achieves a weight tolerance of plus or minus six ounces on a 100-pound charge. The machine also will fill 80-pound fertilizer bags.

The filling machine is a centrifugal belt packer built with twin bag filling tubes and bag chairs equipped with constant settling action. The packer is constructed of welded steel. It has the 160-FB

oscillating frame which carries the twin tubes and bag clamps. The oscillating frame is shifted with one manual motion. As a bag clamp is released, a frame shifts to bring either tube into filling position. While one bag is filling, a filled bag is discharged and an empty bag replaced on the tube which is out of register with the centrifugal pulley.

The 325-PB is equipped with electrical controls which automatically trip the charge from the scale by solenoid action when the oscillating frame is shifted.

Adjustable features have proved these filling machines adaptable to a complete range of fertilizers possessing characteristics from finely ground, almost pulverized particles to heavy granular particles. Because many fertilizers, particularly superphosphates, have a tendency to build or "set" in hoppers if allowed to stand motionless, both machines are designed to keep the plant foods in constant motion during the packing operations.

BRINKLEY APPOINTED VA. AGRICULTURE COMMISSIONER

Parke C. Brinkley, of Nansemond County, has been appointed Commissioner of Agriculture for Virginia by Governor Battle. He succeeded L. M. Walker, Jr., who has served as Commissioner for the past 12 years.

Mr. Brinkley, a graduate in animal husbandry from Virginia Agricultural College, is a successful farmer and former County Agent. He has served as executive secretary of the Virginia Peanut and Hog Growers Association and has been very active in other agricultural organizations.

At a dinner given in Mr. Brinkley's honor after he assumed his new duties, he was assured of the unanimous endorsement of all organized farm groups in the State.

FEBRUARY SUPERPHOSPHATE

With the increase in fertilizer mixing operations during February, the production of superphosphate showed a slight gain, according to the figures of the U. S. Bureau of Census. Total production, figured on the basis of 18 per cent A.P.A., amounted to 847,537 tons, compared with 802,943 tons in January. Shipments topped production by about 20 per cent, 1,049,997 tons having been sent to dry mixers or used in mixing operations in the producing plants. This total is 300,000 tons greater than January shipments. Stocks on hand at producing plants on February 28th were 1,311,549 tons, compared with 1,495,731 tons on January 31st.

	Feb. 1950	Jan. 1950	Feb. 1949
Production	Tons	Tons	Tons
Normal, 18%.	703,152	662,035	748,153
Concentrated, 45%.....	56,481	54,237	41,319
Base Goods, 18%.....	3,182	5,315	5,384
Shipments and Used in Producing Plants			
Normal, 18%.	876,092	603,069	896,509
Concentrated 45%.....	67,157	53,771	44,504
Base Goods, 18%.....	6,012	5,331	10,940
Stocks on Hand, End of Month.			
Normal, 18%.	1,058,711	1,213,378	1,065,307
Concentrated, 45%.....	94,100	104,776	64,034
Base Goods, 18%.....	17,588	20,413	9,177

OUR NATIONAL BANK

Many of the nation's agronomists are urging farmers to build up their soil fertility now while times are still fairly prosperous.

In Illinois the experts are advising that a farmer can't invest money in a better way than to put on all the lime and rock phosphate that the land needs, according to soil tests.

They recommend applying these plant foods during good times when it's easiest to pay for them. It's just like having a savings account in a bank: You build up a reserve and then draw on it as needed.

According to records lime and rock phosphate applied 25 years ago are still helping to produce above-average crops. On ten soil experiment fields scattered over Illinois, lime and rock phosphate were applied regularly until 1922 as part of a regular four-year rotation. Reserves of about eight tons of limestone and four tons of rock phosphate were built up. Since 1922 no lime or phosphate has been added. Other plots received no lime or phosphate at all.

For the eight years 1938–46, corn yields on the treated plots averaged 98 bushels an acre compared with 62 bushels on the untreated plots.

For 1946 alone, on the treated plots where crop residues and 100 pounds of potash had been applied each year, corn crops averaged 108 bushels an acre. This was 38 bushels an acre larger than the yield on untreated plots.

These extra crop yields make it a sound investment to build up a reserve now in your soil fertility bank account while times are good.

Where Are We Going?

Continued from page 9)

manufacture or distribution cannot help but be concerned with. Practically everyone is in it to a greater or less degree. Testing soils for acidity has had a clean bill of health for many years, but complete soil testing has not arrived at that stage in all quarters. We feel that complete soil testing is here to stay but that there is still a lot of sorting of existing methods and development of new ones yet to be done before we have what we really want. It would seem that the colleges and experiment stations are the logical agencies to both perfect and do the major part of the soil testing job; at least, they should guide it. It is usually good procedure to keep the diagnosis of the disease and the sale of the pills to cure it in separate hands, but it is not always feasible to do so. With our better soil testing procedures that have been checked on the soils for which they are being used, the farmer does have new and valuable tools to help guide his soil fertility program.

Benefit to Industry

This will in the end be, in fact already has been, of considerable benefit to the industry, since it will enable the farmer to make a wiser selection of fertilizers. It is not possible to conduct sufficient experiments to tell each and every farmer just what fertilizer and exactly how much will be most profitable for him to use. Since agriculture is nature and nature is ever changing, we will never have the exact answer, but soil testing offers the greatest hope of refining the guesses.

Feeding plants through the leaves has captured the interest of many today. The use of urea preparations in sprays for the fertilization of fruit and some vegetable crops, plus the past experience with certain minor elements in sprays, has created an interest in complete fertilizer to be applied in such a manner. What the future holds here no one knows, but it is not likely to have any great influence on the amount of fertilizer used for ground applications for a few years at least.

Anyone who has been connected with the fertilizer industry for the past few years has heard chemical fertilizer condemned and so-called non-chemical (organic) fertilizer praised as the solution of all or most of the world's nutrition problems. The fact remains that without modern fertilizers there would be a lot of hungry people in the country today. All life consists of chemicals; water, air, soil, plants and animals all consist of combinations of chemicals. The fact that they have been passed through a cow or rotted on a compost heap does not make them non-chemical, and so far as the writer can find there is no real evidence that plant food in manure and compost is any better than plant food in the fertilizer bag, either plant-wise or human-wise.

Perhaps you have some different ideas on this question . . . why not write this magazine and tell us your views.

Human and animal nutrition are both much in the public eye today. There is a lot of guessing going on, much research, and a lot yet to be learned. Since we have more liberty to experiment with animals than we have with humans we probably know more about animal nutrition than we do human. The fact remains, though, that the American people are healthier, better fed and live longer than ever before. Probably the fact that they have a greater choice and greater abundance of fresh fruit, vegetables, milk, meats, eggs, etc., has something to do with this. Without modern fertilizer the choice and abundance of food would not likely be there. We have a lot to learn about the effect of the various mineral plant foods that either are or can be included in fertilizer on the nutritive value of a particular crop. The nutritionists are not too sure about what they want. Crops themselves are variable and they vary as much from soil to soil in mineral content as from different fertilizer practices. We now know, too, that the vitamin content as well as the mineral content is important from a nutrition point of view.

Vitamins

Fertilization probably has some influence on vitamins, directly or indirectly, but it has not yet been clearly worked out. We know varieties of the same crop may differ; maturity at harvest, time of day, amount of sunshine and method of handling and processing all have an influence. Finally, no matter how many desirable minerals and vitamins we put in a plant, a good

proportion of them will go down the kitchen drain. It has been pointed out by Dr. F. E. Bear that modern man in America has choice of so much variety from so many different parts of the country that he has little to worry about if he consumes a reasonable variety of what is available.

When it comes to livestock we know more and the evidence is heavy that intelligently fertilized forage is better feed. Lime and fertilizers have made possible the growth of the more nutritious forage plants in sufficient quantity for stock to fill their bellies. In certain areas, too, mineral deficiencies of the stock have been corrected by the addition of cobalt, manganese or other minerals to the fertilizer or the feed. Probably as our soils become older and we farm them more intensively, more of this will have to be done.

Grassland

Grassland improvement is today coming to the front and getting the recognition it has long been due. In this program, in the east at least, is the greatest undeveloped potential in fertilizer use with real benefits to the farmer and the general public. Many eastern states have launched grassland improvement campaigns and more are planning to. These deserve support, not solely because they are certain to increase fertilizer tonnage, but also because of the lasting benefit to agriculture that is certain to result. Grassland improvement is real soil improvement. It also insures an abundance of the basic health foods.

World Resources

(*Continued from page 7*)

by the output of pig iron. Consequently, there is little opportunity for increasing the supply of such nitrogen independently of the demand for iron.

Chile, the world's largest net exporter of nitrogen, is the only country having large commercial deposits of mineral nitrates, the third most important source of commercial fertilizer nitrogen. The Chilean deposits are said to contain perhaps more than 1,000 million tons of recoverable nitrogen. The nitrogen occurs chiefly as sodium nitrate mixed with other salts, sand, and clay, from which it is recovered by leaching, evaporation, and crystallization. More efficient and economic recovery of the nitrogen with the aid of a solar evaporation process is under investigation.

Although sodium nitrate contains only 16 per cent of nitrogen and must compete in transportation costs with more concentrated forms of the element, this compound is a preferred form of nitrogen in a number of crop producing areas.

Animal by-products and plant residues are important sources of commercial fertilizer nitrogen in some countries. These low-nitrogen materials are, however, generally more valuable as animal feeds than as fertilizers. The nitrogen is expensive, unit transportation costs are high, and the supply is quite limited.

Fixation of atmospheric nitrogen by chemical methods is the only means whereby the world can meet fully its requirements of fertilizer nitrogen. In the increasing order of importance the three commercial methods of nitrogen fixation are the arc, calcium cyanamide, and synthetic ammonia processes.

The arc process for direct union of atmospheric nitrogen and oxygen, now little, if any, used, requires some 64,000 to 67,000 kilowatt-hours of electricity per ton of nitrogen fixed, and its operation has been economic only at locations close to very cheap hydroelectric power—in Norway, for example. A recently developed process—not yet in large-scale operation—which effects the union of nitrogen and oxygen by means of fuel, is said to have commercial promise.

The cyanimide process also calls for a high expenditure of electric power—9,000 to 14,000 kilowatt-hours per ton of nitrogen fixed—and considerable coal and lime.

The synthetic ammonia process is generally the cheapest and most desirable method of chemically fixing nitrogen. As hydrogen, the principal raw material expense, is produced readily with coal, coke, charcoal, or natural gas, the process is adapted to use in any country having low-cost supplies of these materials. With such sources of hydrogen the electric power requirement of the process is small.

Excluding the Soviet Union and the Soviet occupation zone of Germany, the world productive capacity, production, and stated requirement for crops of all types of commercial fertilizer nitrogen in the years ending June 30, 1939, 1948 and 1951, as reported by governments to the Committee on Fertilizers of the International Emergency Food Committee in 1948, are as follows:

	1,000 Tons of Nitrogen		
	1938/39	*1947/48*	*1950/51*
Productive capacity	2,691[3]	3,379	4,162
Production	1,985	2,731	3,957
Stated requirement for crops	[4]	3,570	4,813

[3] The metric ton is used throughout this paper.
[3] Includes the writers' estimate of 560,000 tons for the Bizone and French Zone of Germany.
[4] Date not available.

The requirement indicated for 1950–51 apparently contemplates fertilization of an increased area at heavier rates per unit of land.

(Continued next issue)

Minor Elements

(*Continued from page 6*)

	Per Cent
Magnesia, MgO	0.78
Lime, CaO	16.38
Soda, Na_2O	4.08
Alumina, Al_2O_3	0.58
Copper oxide, CuO	0.006
Iron oxide, Fe_2O_3	0.08
Manganese oxide, MnO	0.024
Zinc oxide, ZnO	0.022
Boric oxide, B_2O_3	0.012
Chlorine, Cl	5.86
Fluorine, F	0.70
Sulphuric oxide, SO_3	20.04
Ammonia, NH_3	2.76
Phosphoric oxide, P_2O_5	9.87
Potash, K_2O	5.36
Organic matter, etc.	6.26
Protein	3.94
Moisture	4.90
Water of hydration	3.58
CORRECTED TOTAL	99.96

Although the purpose was not to point up these other elements, it is evident from this composite analysis that substantial amounts of some micronutrients are being applied annually to some American farm soils through commercial fertilizers. Adequate? Of course, the amounts represented are by no means adequate.

(Continued next issue)

BUYERS' GUIDE • A CLASSIFIED INDEX TO ALL THE ADVERTISERS IN "THE AMERICAN FERTILIZER"

AMMONIA—Anhydrous and Liquor
Barrett Div., Allied Chemical & Dye Corp., New York City
Commercial Solvents Corp., New York City
Lion Oil Co. El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE
Lion Oil Co., El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

BAG MANUFACTURERS—BURLAP
Bemis Bros. Bag Co., St. Louis, Mo.
Chase Bag Co., Chicago, Ill.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Mente & Co. Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
Chase Bag Co., Chicago, Ill.
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Mente & Co. Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

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Jaite Company, The, Jaite, Ohio
Kraft Bag Corporation, New York City
Mente & Co. Inc., New Orleans, La.
Raymond Bag Co., Middletown, Ohio
St. Regis Paper Co., New York City
Virginia Carolina Chemical Corp,. Richmond,Va.

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
Huber & Company, New York City
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES
International Paper Co., Bagpak Div., New York City
St. Regis Paper Co., New York City

BAG PRINTING MACHINES
Schmutz Mfg. Co., Louisville, Ky.

BAGGING MACHINES—For Filling Sacks
Atlanta Utility Works, The, East Point, Ga.
St. Regis Paper Co., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Company, Boston, Mass.

BONE PRODUCTS—BONE BLACK
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
Huber & Company, New York City
Jackle, Frank R., New York City
McIver & Son, Alex M., Charleston, S. C.
Scar-Lipman & Co., New York City
Tuteur & Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID
American Potash and Chem. Corp., New York City

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J.. New York City
Davidson Commission Co., The, Chicago, Ill.
Huber & Company, New York City
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

BUCKETS—For Hoists, Cranes, etc.
Hayward Company, The, New York City

BUCKETS—Elevator
Baughman Manufacturing Co., Jerseyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

CARS AND CARTS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

CASTOR POMACE
McIver & Son, Alex. M., Charleston, S. C.

CHEMICALS
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Barrett Div., Allied Chemical & Dye Corp., New YorkCity
Commercial Solvents Corp., New York City
Davison Chemical Corporation, Baltimore, Md.
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
Lion Oil Company, El Dorado. Ark.
Koppers Company Inc., Tar Products Div., Pittsburgh, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
Scar-Lipman & Co., New York City
Spencer Chemical Co., Kansas City, Mo.
United States Steel Corp., New York City
Virginia-Carolina Chemical Corp., Richmond,Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.
Woodward Iron Company, Woodward, Ala.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Wiley & Company, Baltimore, Md.

CONDITIONERS
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio
Quaker Oats Company, Chicago, Ill.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
Jackle, Frank R., New York City
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Scar-Lipman & Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

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Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City
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Sturtevant Mill Company, Boston, Mass.
Titlestad Corporation, Nicolay, New York City

FERTILIZER (Mixed) MANUFACTURERS
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago
Southern States Phosphate & Fertilizer Co., Savannah, Ga
Virginia-Carolina Chemical Corp., Richmond, Va.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

A Classified Index to Advertisers in "The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the Advertisers, see page 31

HOPPERS

Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore ,Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

IMPORTERS, EXPORTERS

Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Scar-Lipman & Co., New York City
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES

American Agricultural Chemical Co., New York City

LEAD BURNERS

Southern Lead Burning Co., Atlanta, Ga.

LIMESTONE

American Agricultural Chemical Co., New York City
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

LOADERS—Car and Wagon

Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making and Handling

Atlanta Utility Works, The East Point, Ga.
Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Ammoniating

Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Grinding and Pulverizing

Atlanta Utility Works, The, East Point, Ga.
Bradley Pulverizer Co., Allentown, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Material Handling

Atlanta Utility Works, The, East Point, Ga.
Baughman Manufacturing Co., Jerseyville, Ill
Hayward Company, The, New York City
Hough Co., The Frank G., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MACHINERY—Mixing, Screening and Bagging

Atlanta Utility Works, The, East Point, Ga.
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Sturtevant Mill Company, Boston, Mass.
Universal Vibrating Screen Co., Racine, Wis.

MACHINERY—Power Transmission

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MACHINERY—Superphosphate Manufacturing

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Stedman Foundry and Mach. Works, Aurora, Ind.
Sturtevant Mill Company, Boston, Mass.

MANGANESE SULPHATE

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MINOR ELEMENTS

Tennessee Corporation, Atlanta, Ga.

MIXERS

Atlanta Utility Works, The, East Point, Ga.
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Sturtevant Mill Company, Boston, Mass.

NITRATE OF SODA

American Agricultural Chemical Co., New York City
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International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., New York City

NITROGEN SOLUTIONS

Barrett Div., Allied Chemical & Dye Corp., New York City
Lion Oil Company, El Dorado, Ark.
Phillips Chemical Co,, Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

NITROGENOUS ORGANIC MATERIAL

American Agriculture Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
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Davidson Commission Co., The, Chicago, Ill.
Huber & Company, New York City
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Scar-Lipman & Co., New York City
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Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray

Monarch Mfg. Works, Philadelphia, Pa.

PHOSPHATE ROCK

American Agricultural Chemical Co., New York City
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Huber & Company, New York City
Davison Chemical Corporation, Baltimore, Md.
International Minerals & Chemical Corporation, Chicago, Ill.
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Virginia-Carolina Chemical Corp., Richmond, Va.

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Southern Lead Burning Co., Atlanta, Ga.
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POTASH SALTS—Dealers and Brokers

American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill
Jackle, Frank R., New York City
McIver & Son, Alex M., Charleston, S. C.
Scar-Lipman & Co., New York City

POTASH SALTS—Manufacturers

American Potash and Chemical Corp., New York City
Potash Co. of America, New York City
International Minerals & Chemical Corporation, Chicago, Ill
United States Potash Co., New York City

PRINTING PRESSES—Bag

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Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora, Ind.

BUYERS' GUIDE

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Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aur ora,Ind

SCREENS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Mach. Works, Aurora. Ind.
Sturtevant Mill Company, Boston, Mass.
Universal Vibrating Screen Co., Racine, Wis.

SEPARATORS—Air
Sackett & Sons Co., The A. J., Baltimore, Md.
Sturtevant Mill Co., Boston, Mass.

SPRAYS—Acid Chambers
Monarch Mfg. Works, Inc., Philadelphia, Pa.

SULPHATE OF AMMONIA
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Barrett Div., Allied Chemical & Dye Corp., New York City
Huber & Company, New York City
Jackle, Frank R., New York City
Koppers Co., Inc., Tar Products Div., Pittsburgh, Pa.
Lion Oil Co., El Dorado, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
Scar-Lipman & Co., New York City
United States Steel Corp., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.
Woodward Iron Company, Woodward, Ala.

SULPHUR
Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co. New York City

SULPHURIC ACID
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Huber & Company, New York City
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U.S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davison Chemical Corporation, Baltimore, Md.
Huber & Company, New York City
International Minerals & Chemical Corporation. Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U.S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
International Minerals & Chemical Corporation, Chicago, Ill.
U.S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

TANKAGE
American Agricultural Chemical Co., New York City
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davidson Commission Co., The, Chicago, Ill.
International Minerals & Chemical Corporation, Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

VALVES
Atlanta Utility Works, The. East Point. Ga.
Monarch Mfg. Works, Inc.. Philadelphia, Pa.

Alphabetical List of Advertisers

APFC Convention

(*Continued from page 8*)

Judge Woodrum announced the following Convention Committees: CONVENTION—J. A. Howell, President, Virginia-Carolina Chemical Corporation, Richmond, Chairman; A. F. Reed, Vice President, Lion Oil Company, El Dorado, Arkansas; R. C. Simms, President, Naco Fertilizer Company, New York City; Paul Speer, Vice President, U. S. Potash Company, New York City; Fred J. Woods, President, Gulf Fertilizer Company, Tampa, Florida and W. T. Wright, Vice President, F. S. Royster Guano Company, Norfolk, Virginia.

CREDENTIALS—W. L. Waring, Jr., President, Lyons Fertilizer Company, Tampa, Fla., Chairman; J. C. Crissey, Division Manager, G. L. F. Soil Building Service, Ithaca, N. Y. and Howard Fisher, Gen. Mgr., The Michigan Fertilizer Company, Lansing, Michigan.

GOLF—Albert B. Baker, Jr., Bradley & Baker, New York City, Chairman; C. F. Burroughs, Jr., F. S. Royster Guano Company, Norfolk, Va.; Dean R. Gidney, U. S. Potash Company, New York City; J. W. Ground, III, Thurston Chemical Co., Joplin, Missouri and W. F. McLane, Lyons Fertilizer Co., Tampa, Fla.

HOSPITALITY—G. Tracy Cunningham, Asst. Gen. Sales Mgr., Armour Fertilizer Works, Atlanta, Georgia, Chairman; Paul Ausley, Potash Company of America, New York City; L. R. Boynton, Mgr., U. S. Potash Co., Atlanta, Ga.; Roy F. Camp, Vice President, Chilean Nitrate Sales Corp., New York City; Wm. B. Copeland, Vice President, Smith-Douglass Co., Inc., Streator, Illinois; Malcolm E. Hunter, Gen. Sales Mgr., Virginia-Carolina Chemical Corp., Richmond; F. B. Stephenson, Vice President, Robertson Chemical Corp., Norfolk, Virginia; J. D. Stewart, Jr., Executive Vice President, Federal Chemical Co., Louisville, Kentucky and G. A. Woods, Potash Company of America, Raleigh, North Carolina.

LADIES—Mrs. A. B. Baker, Sr. of New York City, Chairman; Mrs. Horace M. Albright of New York City; Mrs. L. Dudley George of Richmond, Virginia; Mrs. John E. Sanford of Atlanta, Georgia; Mrs. J. D. Stewart, Jr. of Louisville, Kentucky; Miss Martha Anne Woodrum, Roanoke, Virginia and Mrs. H. B. Caldwell, Greensboro, N. C.

MEMORIAL—L. Dudley George, Sec.-Treas., Richmond Guano Co., Richmond, Va., Chairman; George T. Ashford, Manager, Liberty Manufacturing Co., Red Springs, N. C. and J. E. Culpepper, Asst. Gen. Sales Mgr., Spencer Chemical Co., Kansas City, Missouri.

SHORTIES...

The only sure thing about luck is that it will change.

★

I have never been hurt by anything I didn't say.—Calvin Coolidge

★

"Every individual in this country has to give up things he would like to have because he hasn't the money to pay for them. The government is no different than an individual."
—Senator Taft

★

If an infant can't think, why does it yell the moment it sees the kind of world it is in?

★

Tomorrow morning there will be 55,000 more persons for breakfast than there were in the world this morning.

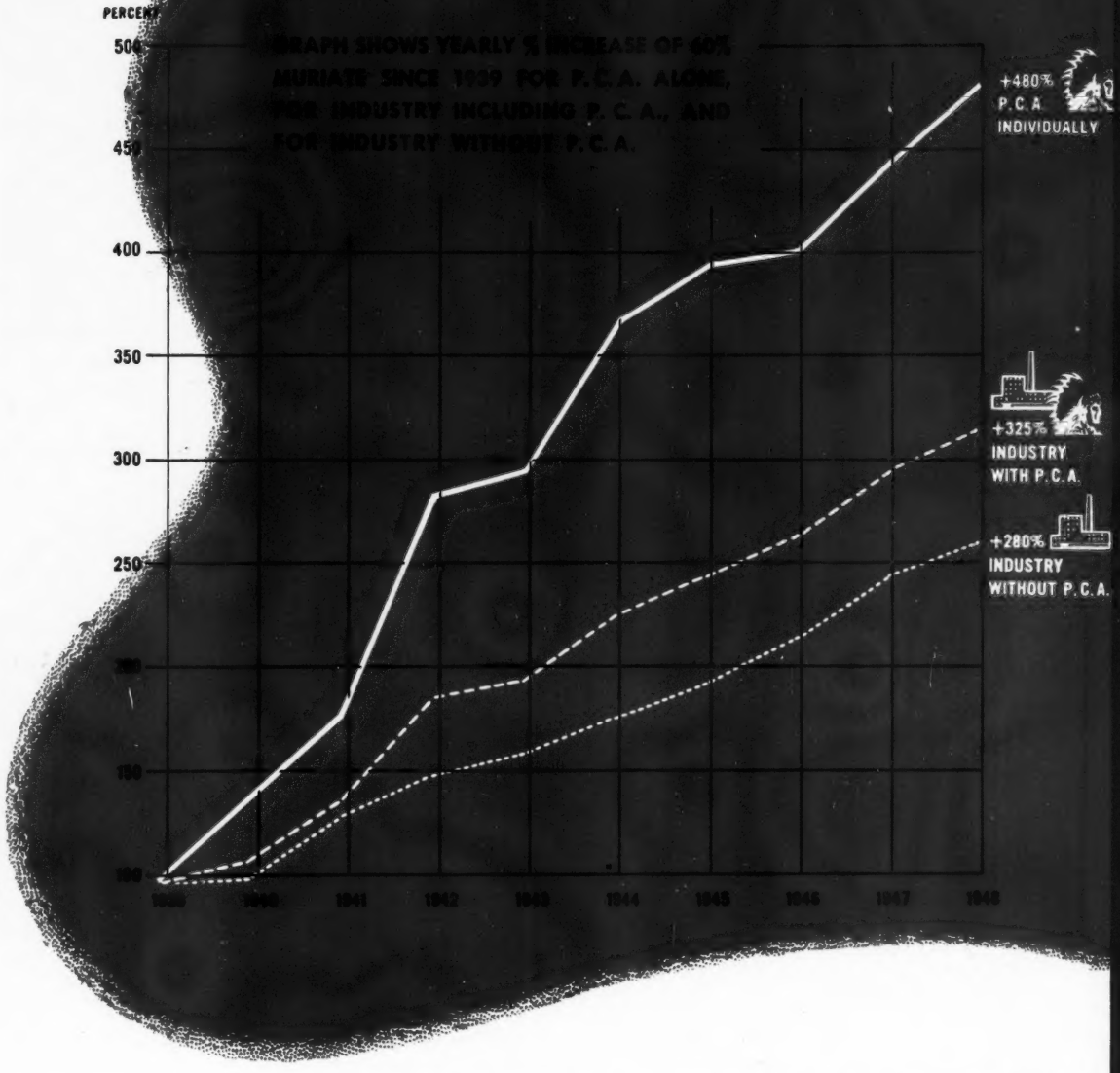
★

Few nests are feathered in wild goose chases.

★

What's more discouraging than to put together a wonderful planned economy, only to discover half a dozen leftover facts of life?

been doing some figuring . . .



1948 was a record year for domestic Potash. Using '39 as a base, the industry—not including P.C.A.—showed an increase of 280% in 60% Muriate. P.C.A. production lifts the industry increase to 325%. ***P.C.A. alone shows a High Grade Muriate increase for the same period of 480%.***

95% of all P.C.A.'s '48 deliveries were in the form of 60% Muriate. Our new $4,000,000 production and refining facilities now are operating. Our deliveries for '49-'50 will break all previous records. In fact, P.C.A.'s production capacity for 60% Muriate this year will exceed by some 150,000 tons the entire potash consumption — all grades — of the nation ten years ago.

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